

WE CLAIM:

1. A solid composite polymer electrolyte comprising:
 a general amorphous branched polymer having
 recurrent units, each of which includes a backbone
 chain and at least a side chain linked to said backbone
 chain and containing at least one coordination
 potential atom;

an amphoteric metal salt dispersed in said
 branched polymer and forming Lewis acid-base

10 interactions with said side chains; and

an amphoteric Lewis acid-base ceramic filler
 dispersed in said branched polymer and forming Lewis
 acid-base interactions with said side chains and said
 metal salt.

15 2. The solid composite polymer electrolyte of Claim
 1, wherein said backbone chain of said branched
 polymer is selected from a group consisting of a -P=N-
 group and a -C-C- group, and said coordination
 potential atom of said side chain is selected from
 20 a group consisting of an alkoxy group and a $C\equiv N$ group.

3. The solid composite polymer electrolyte of Claim
 2, wherein said backbone chain of said branched
 polymer is a -P=N- group, and said coordination
 potential atom of said side chain is an alkoxy group.

25 4. The solid composite polymer electrolyte of Claim
 3, wherein said branched polymer is poly[bis(methoxy
 ethoxyethoxy)phosphazene] having a molecular weight

ranging from about 1000 to about 10^6 .

5. The solid composite polymer electrolyte of Claim 2, wherein said backbone chain of said branched polymer is a -C-C- group, and said coordination

5 potential atom of said side chain is a $C\equiv N$ group.

6. The solid composite polymer electrolyte of Claim 5, wherein said branched polymer is polyacrylonitrile having a molecular weight ranging from about 10000 to about 10^7 .

10 7. The solid composite polymer electrolyte of Claim 2, wherein said ceramic filler is made from a material selected from a group consisting of α - Al_2O_3 and TiO_2 .

8. The solid composite polymer electrolyte of Claim 7, wherein said metal salt is a lithium salt.

15 9. The solid composite polymer electrolyte of Claim 8, wherein said lithium salt is lithium perchlorate.

10. The solid composite polymer electrolyte of Claim 9, wherein said branched polymer is poly[bis(methoxy ethoxyethoxy)phosphazene], and said ceramic filler
20 is made from α - Al_2O_3 , said solid composite polymer electrolyte comprising 86 to 95% by weight of poly[bis(methoxy ethoxyethoxy)phosphazene], 4 to 9% by weight of lithium perchlorate, and 1 to 5% by weight of α - Al_2O_3 .

25 11. The solid composite polymer electrolyte of Claim 10, comprising 90 to 92.5% by weight of poly[bis(methoxy ethoxyethoxy)phosphazene], 5.5 to

7% by weight of lithium perchlorate, and 2 to 3% by weight of α -Al₂O₃.

12. The solid composite polymer electrolyte of Claim 9, wherein said branched polymer is polyacrylonitrile, 5 said solid composite polymer electrolyte comprising 41 to 70% by weight of polyacrylonitrile, 27 to 50% by weight of lithium perchlorate, and 3 to 9% by weight of said ceramic filler.

13. The solid composite polymer electrolyte of Claim 10 12, comprising 47 to 60% by weight of polyacrylonitrile, 35 to 45% by weight of lithium perchlorate, and 5 to 8% by weight of said ceramic filler.

14. The solid composite polymer electrolyte of Claim 15 7, wherein said ceramic filler has a particle size less than 150 microns.